Sensitivity of Runway Occupancy Time (ROT) to Various Rollout and Turnoff (ROTO) Factors

Volume II - Complete Set of Plotted Data

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Hampton, Virginia 23681-0001
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MD-11; dry surface condition; Table data row 2

MD-81; wet surface condition; Table data row 3

MD-81; dry surface condition; Table data row 4

Statistics

Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 4950
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5350
Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
Statistics
Autoreverse thrust & variable deceleration
with exit prediction
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NO exit prediction
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Statistics
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NO exit prediction
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Statistics
Immediate med const reverse thrust & immed. const 6.5 decel
NO exit prediction
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Constant reverse thrust & roll-constant 6.5 decel
with exit prediction
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Statistics

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Statistics
Constant reverse thrust & variable deceleration with exit prediction
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MD-81; wet surface condition; Table data row 58

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Statistics
Autoreverse thrust & variable deceleration with exit prediction
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60 knot exit speed
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MD-11; dry surface condition; Table data row 62

MD-81; wet surface condition; Table data row 63

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Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
80 knot exit speed
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Statistics

Autoreverse thrust & variable deceleration with exit prediction
mid exit location = 6950
60 knot exit speed
Statistics

Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 4950
80 knot exit speed
MD-11; wet surface condition; Table data row 76

MD-11; dry surface condition; Table data row 77

MD-81; wet surface condition; Table data row 78

MD-81; dry surface condition; Table data row 79

Statistics

Autoreverse thrust & variable deceleration
with exit prediction
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MD-81; wet surface condition; Table data row 83

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Statistics
Autoreverse thrust & variable deceleration
with exit prediction
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TD dispersion sigma=100
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with exit prediction
mid exit location = 5950
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• MD-11; dry surface condition; Table data row 92
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Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
TD gnd speed sigma=5
Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
no crosswind
Statistics

Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
gusting crosswind 12.5 +2.5sigma, sensor noise
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Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
predict TD location error of 300 feet
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MD-11; dry surface condition; Table data row 112

MD-81; wet surface condition; Table data row 113

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Constant reverse thrust & roll-constant 6.5 deceleration
with exit prediction
mid exit location = 5950
predict TD location error of 300 feet

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MD-11; dry surface condition; Table data row 117
MD-81; wet surface condition; Table data row 118
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Statistics
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with exit prediction
constant 2900 ft exit radius
mid exit location = 5950
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• MD-11; dry surface condition; Table data row 122
• MD-81; wet surface condition; Table data row 123
• MD-81; dry surface condition; Table data row 124

Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 4550
<table>
<thead>
<tr>
<th>Surface Condition</th>
<th>Data Row</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD-11, wet</td>
<td>126</td>
</tr>
<tr>
<td>MD-11, dry</td>
<td>127</td>
</tr>
<tr>
<td>MD-81, wet</td>
<td>128</td>
</tr>
<tr>
<td>MD-81, dry</td>
<td>129</td>
</tr>
</tbody>
</table>

### Statistics

Autoreverse thrust & variable deceleration with exit prediction
mid exit location = 6550
MD-11; ice surface condition; Table data row 131
MD-11; snow surface condition; Table data row 132
MD-11; slush surface condition; Table data row 133
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MD-11 on various surface conditions
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
Statistics
MD-81 on various surface conditions
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
Statistics

Reverse Thrust not stowed, idle on exit
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location = 5950
Statistics

2 high-speed exit locations at 5225 & 6650 feet
Autoreverse thrust & variable deceleration
with exit prediction
1 high-speed exit location at 5950 feet
Autoreverse thrust & variable deceleration
with exit prediction
4th high-speed exit location at 8300 feet
with original mid exit location at 5350 feet
Autoreverse thrust & variable deceleration
with exit prediction
Statistics
Lateral touchdown offset of Y=27 feet
mid exit location at 5950
Autoreverse thrust & variable deceleration
with exit prediction
Statistics
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mid exit location at 5950 feet
Autoreverse thrust & variable deceleration
with exit prediction
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MD-11; dry surface condition; Table data row 172
MD-81; wet surface condition; Table data row 173
MD-81; dry surface condition; Table data row 174

Statistics
Allow for a maximum deceleration of 9 ft/s/s
mid exit location at 5350 feet
Autoreverse thrust & variable deceleration
with exit prediction
Anti-skid efficiency equals 90%
mid exit location at 5350 feet
Autoreverse thrust & variable deceleration
with exit prediction
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MD-11; dry surface condition; Table data row 182

MD-81; wet surface condition; Table data row 183

MD-81; dry surface condition; Table data row 184

Statistics
Anti-skid efficiency equals 60%
mid exit location at 5950 feet
Autoreverse thrust & variable deceleration
with exit prediction

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Auto reverse thrust & variable deceleration

Statistics

Exit #

% using runway

Value (left 3 'x axis' items)

% ROT > 53.4

Exit #

Value (right 3 'x axis' items)

MD-11; wet surface condition; Table data row 186

MD-81; dry surface condition; Table data row 187

MD-11; dry surface condition; Table data row 186

MD-81; wet surface condition; Table data row 186
- MD-11; wet surface condition; Table data row 191
- MD-11; dry surface condition; Table data row 192
- MD-81; wet surface condition; Table data row 193
- MD-81; dry surface condition; Table data row 194

Statistics
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location at 5950 feet
40 kt exit entrance speed
<table>
<thead>
<tr>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Thrust not stowed on exit</td>
</tr>
<tr>
<td>Autoreverse thrust &amp; variable deceleration</td>
</tr>
<tr>
<td>with exit prediction</td>
</tr>
<tr>
<td>mid exit location at 5950 feet</td>
</tr>
</tbody>
</table>

### Table Data

<table>
<thead>
<tr>
<th>ROT</th>
<th>% using end of runway</th>
<th>% ROT &gt; 53.4</th>
<th>ROT STDEV</th>
<th>Exit #</th>
<th>Exit # STDEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example Data Row:**

<table>
<thead>
<tr>
<th>ROT MEAN (sec)</th>
<th>% using end of runway</th>
<th>% ROT &gt; 53.4</th>
<th>ROT STDEV (sec)</th>
<th>Exit #</th>
<th>Exit # STDEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aircraft</td>
<td>Surface Condition</td>
<td>Table Row</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD-11</td>
<td>Wet</td>
<td>201</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD-11</td>
<td>Dry</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD-81</td>
<td>Wet</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD-81</td>
<td>Dry</td>
<td>204</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Statistics**

Reverse Thrust Idle on Runway
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location at 5950 feet

<table>
<thead>
<tr>
<th>ROT</th>
<th>% using end of runway</th>
<th>% ROT &gt; 53.4</th>
<th>ROT STDEV</th>
<th>Exit #</th>
<th>Exit # STDEV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(sec)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(sec)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• MD-11; wet surface condition; Table data row 206

• MD-11; dry surface condition; Table data row 207

• MD-81; wet surface condition; Table data row 208

• MD-81; dry surface condition; Table data row 209

Statistics
NO Reverse Thrust
Autoreverse thrust & variable deceleration
with exit prediction
mid exit location at 5950 feet
MD-11; wet surface condition; Table data row 211

MD-11; dry surface condition; Table data row 212

MD-81; wet surface condition; Table data row 213

MD-81; dry surface condition; Table data row 214

Statistics

Immediate max const reverse thrust & immed. const 6.5 decel
NO exit prediction
mid exit location = 4950
MD-11; wet surface condition; Table data row 216
MD-11; dry surface condition; Table data row 217
MD-81; wet surface condition; Table data row 218
MD-81; dry surface condition; Table data row 219

Statistics
Immediate max const reverse thrust & immed. const 6.5 decel
NO exit prediction
mid exit location = 5350
- MD-11; wet surface condition; Table data row 221
- MD-11; dry surface condition; Table data row 222
- MD-81; wet surface condition; Table data row 223
- MD-81; dry surface condition; Table data row 224

**Statistics**

Immediate max const reverse thrust & immed. const 6.5 decel
NO exit prediction
mid exit location = 5950
Statistics
Auto asymmetric braking on exit
Auto reverse thrust/variable braking
with exit prediction
mid exit location = 5950
Anti-skid efficiency equals 90%
Mid exit location at 5950 feet
Autoreverse thrust & variable deceleration with exit prediction
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- MD-11; dry surface condition; Table data row 237
- MD-81; wet surface condition; Table data row 238
- MD-81; dry surface condition; Table data row 239

Statistics
Autoreverse thrust & variable deceleration
with exit prediction
Mid exit location at 5350 feet
40 kt exit entrance speed
Predict exit prior to TD

Weight = 340K + (480K - 340K)/(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)/(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=49, STDEV=6.82

All exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=41, STDEV=3.89

All Exits
- --- Exit 1
- --- Exit 2
- --- Exit 3
- - Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=48, STDEV=5.34

All Exits
-- Exit 1
-. Exit 2
-. Exit 3
-. Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 * (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 3900, 5350, 6950, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel

Mean=41.1, STDEV=3.965

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet

Probability

0.45  0.4  0.35  0.3  0.25  0.2  0.15  0.1  0.05  0

56
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Runway Occupancy Time
MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

TD X Location Past Threshold
TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=47.2, STDEV=4.16

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)(VEAS - 130)/36

Dry, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Slow Reverse Thrust = 70 kt gd

MD-11 ROTO Occupancy Time

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel
Mean=46.8, STDEV=4.017

MD-11 Runway Occupancy Time
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K)(VEAS - 110)/33
CG = -0.008 + (0.334 - (-0.008))(VEAS - 110)/33

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=41.2, STDEV=3.219

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel
Mean=41.2, STDEV=3.219

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4300, 5950, 7550, 10000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=47.7, STDEV=4.13

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4300, 5950, 7550 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4300, 5950, 7550, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=41.5, STDEV=4.161

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4300, 5950, 7550 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Full Flaps
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/full flaps
Mean=46.4, STDEV=3.9

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust / variable Deceleration
Full Flaps
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/full flaps
Mean=41.2, STDEV=3.505

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Immediate medium reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Medium reverse thrust/constant 6.5 decel
Mean=48.5, STDEV=9.01

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
No exit prediction

Weight = 82K + (128K - 82K)(VEAS - 110)/33
CG = -0.008 + (0.334 - (-0.008))(VEAS - 110)/33

MD-81 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Immediate medium reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

TD Ground Speed = Airspeed + Average Tailwind

Runway Occupancy Time

57 53 49 45 41 37 142+7 138+3 134-1 130-5 126-9 122-13 118-17 114-21 110-25

TD X Location Past Threshold

2313 2233 2133 2033 1933 1833 1733 1633 1533 1433 1333 1233 1133 1033 933 833 733 633 533 433 333
MD-81 ROTO ROT Probability Distribution
Wet, Medium reverse thrust/constant 6.5 decel
Mean=41.3, STDEV=5.099

- All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Immediate medium reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
No exit prediction

Weight = 82K + (128K - 82K) * (VEAS - 110)/33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110)/33

MD-81 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Immediate medium reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Medium reverse thrust/constant 6.5 decel
Mean=41.3, STDEV=4.894

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) \times (\text{VEAS} - 130) / 36
CG = 0.12 + (0.34 - 0.12) \times (\text{VEAS} - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Immediate medium reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Medium reverse thrust/constant 6.5 decel
Mean=46.6, STDEV=6.12

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Immediate medium reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Medium reverse thrust/constant 6.5 decel
Mean=44.7, STDEV=4.74

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Immediate medium reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway
MD-81 ROTO ROT Probability Distribution

Wet, Medium reverse thrust/constant 6.5 decel
Mean=42.5, STDEV=4.34

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 82K + (128K - 82K) \times (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) \times (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Immediate medium reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

Runway
Occupancy
Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location
Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Medium reverse thrust/constant 6.5 decel
Mean=40.9, STDEV=4.161

All Exits
--- Exit 1
-. --- Exit 2
--.- Exit 3
-.-.-. Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)^*(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)^*(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/roll-constant 6.5 decel
Mean=45.7, STDEV=3.73

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)*(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)*(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Dry Exits = 4500, 5950, 7350, 10000

Constant Reverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

TD X Location Past Threshold

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Dry, Constant reverse thrust/roll-constant 6.5 decel
Mean=43.6, STDEV=3.62

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = 0.008 + (0.334 * (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/Roll constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
MD-81 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/roll-constant 6.5 decel
Mean=41.7, STDEV=3.731

All Exits
- - - - Exit 1
- - - - Exit 2
- - - - Exit 3
- - - - Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

TD Ground Speed = Airspeed + Average Tailwind

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41
MD-81 ROTO ROT Probability Distribution
Dry, Constant reverse thrust/roll-constant 6.5 decel
Mean=40.8, STDEV=3.688

All Exits

- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight=340K+(480K-340K)*(VEAS-130)/36
CG=0.12+(0.34-0.12)*(VEAS-130)/36

MD-11 ROTO Occupancy Time

Wet, Exits=4500, 5950, 7350, 10000
Auto reverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
Half coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

53-57
49-53
45-49
41-45
37-41
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/roll-constant 6.5 decel
Mean=47.1, STDEV=5.27

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/roll-constant 6.5 decel
Mean=43.8, STDEV=3.65

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Roll-constant 6.5 Deceleration
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/roll-constant 6.5 decel
Mean=40.8, STDEV=3.57

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/roll-constant 6.5 decel
Mean=39.6, STDEV=3.539
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/variable decel
Mean=47.3, STDEV=4.14

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) × (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) × (VEAS - 130) / 36

Dry, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Constant reverse thrust/variable decel
Mean=46.8, STDEV=4.026

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/variable decel
Mean=46.7, STDEV=4.407

All Exit

Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Constant Reverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

TD Ground Speed = Airspeed + Average Tailwind

Runway Occupancy Time

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Constant reverse thrust/variable decel
Mean=41.2, STDEV=3.217

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust / Variable Deceleration
Stow Reverse Thrust = 60 kt gd
60 knot high speed exit

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=51.6, STDEV=5.19

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = 0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 60 kt gd
60 knot high speed exit

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=44.6, STDEV=4.001

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 80 kt gd
80 knot high speed exit

Runway Occupancy Time

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/80 kt exit speed
Mean=41.8, STDEV=3.78

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 80 kt gd
80 knot high speed exit

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

[Diagram with data points and labels]
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/80 kt exit speed
Mean=38.1, STDEV=2.991

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)*(VEAS-130)/36
CG = 0.12 + (0.34 - 0.12)*(VEAS-130)/36

MD-11 ROTO Occupancy Time

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41

TD Ground Speed = Airspeed + Average Tailwind

Wet, Exits = 5500, 6950, 8350, 12000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 60 kt gd
60 knot high speed exit

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=50.7, STDEV=4.23

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5500, 6950, 8350 & 12000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 60 kt gd
60 knot high speed exit
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=48.8, STDEV=4.041

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5500, 6950, 8350 & 12000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
80 kt exit speed
Stow Reverse Thrust = 80 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution

Mean=42.8, SD=5.64

Wet, Auto reverse thrust/Variable decel/80 kt exit speed

All Exits
Exit 1
Exit 2
Exit 3
Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet

0.45 0.4 0.35 0.3 0.25 0.2 0.15 0.1 0.05 0

Probability

126
Predict exit prior to TD
Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
80 kt exit speed
Slow Reverse Thrust = 80 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/80 kt exit speed
Mean=36.1, STDEV=3.893

All Exits
- -- Exit 1
- - - Exit 2
- - - Exit 3
- - - Exit 4

Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36

CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000

Autoreverse Thrust/Variable Deceleration

Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/disp sigma=375
Mean=47.2, STDEV=4.47

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K-340K) * (VEAS-130) / 36
CG = 0.12 + (0.34-0.12) * (VEAS-130) / 36

Dry, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

MD-11 ROTO Occupancy Time

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/dispersion sigma=375
Mean=46.8, STDEV=4.321

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K)(VEAS - 110)/33
CG = -0.008 + (0.334 - (-0.008))(VEAS - 110)/33

MD-81 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/dispersion sigma=375
Mean=41.5, STDEV=3.381

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 Roto Occupancy Time

Dry, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/dispersion sigma=375
Mean=41.5, STDEV=3.381

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/dispersion sigma=100
Mean=47.2, STDEV=4.02

All Exits:
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130)/36

Dry Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

TD Ground Speed = Airspeed + Average Tailwind
Dry, Auto reverse thrust/variable decel/dispersion sigma=100

MD-11 ROTO ROT Probability Distribution
Mean=46.7, STDEV=3.871

MD-11 Runway Occupancy Time
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet

All Exits
Exit 1
Exit 2
Exit 3
Exit 4
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/dispersion sigma=100
Mean=41.1, STDEV=3.13

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Dry, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/dispersion sigma=100
Mean=41.1, STDEV=3.13

probability

All Exits
--- Exit 1
----- Exit 2
--- Exit 3
----- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Slow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/gnd speed sigma=17
Mean=47.6, STDEV=5.49

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Dry, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust / variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/gnd speed sigma=17
Mean=47.1, STDEV=5.302

All Exits

- Exit 1
- Exit 2
- Exit 3
- Exit 4

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/gnd speed sigma=17
Mean=42.7, STDEV=3.972

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Dry Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

MD-81 ROTO Occupancy Time

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/gnd speed sigma=17
Mean=42.7, STDEV=3.972

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \times (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) \times (VEAS - 130) / 36
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/gnd speed=5
Mean=46.4, STDEV=3

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36
MD-11 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/gnd speed sigma=5
Mean=46.1, STDEV=2.629

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/gnd speed sigma=5
Mean=39.6, STDEV=2.288

All Exits
Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = $82K + (128K-82K)^*$(VEAS-110)/33
CG = $-0.008+(0.334-(-0.008))^*$(VEAS-110)/33

Dry, exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Dry, Auto reverse thrust/variable decel/gnd speed sigma=5
Mean=39.6, STDEV=2.288

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K)*(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)*(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
NO crosswind
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/no crosswind
Mean=46.7, STDEV=4.09

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) \times (VEAS - 110) / 33
CG = -0.008 + (0.334 + (-0.008)) \times (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/variable Deceleration
NO crosswind
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/no crosswind
Mean=41.1, STDEV=3.258

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Gusting crosswind 12.5kts, sigma = 2.5
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/variable Deceleration
Gusting crosswind 12.5 kts, sigma = 2.5
Stow Reverse Thrust = 70 kt gd
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/gusting crosswind 12.5kts, sigma=2.5
Mean=41.4, STDEV=3.399

All Exits

Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
predict TD location error = +300
Slow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

1050
1250
1450
1650
1850
2050
2250
2450

450
650
850
1050
1250
1450
1650
1850
2050
2250
2450

160+5
160+7
165+18
170+5
175+5
180+5
185+5
190+5
195+5
200+5
205+5
210+5
215+5
220+5
225+5
230+5
235+5
240+5
245+5
250+5

53-57
49-53
45-49
41-45
37-41
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/predict TD location error = +300
Mean=49.2, STDEV=4.51

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight=82K+(128K-82K)*(VEAS-110)/33
CG=-0.008+(0.334-(-0.008))*(VEAS-110)/33

MD-81 ROTO Occupancy Time

Wet, Exits=4500, 5950, 7350, 10000
Auto reverse thrust/variable deceleration
Predict TD location error = +300
Stow reverse thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/predict TD location error = +300
Mean=43.3, STDEV=3.718

All Exits
--- Exit 1
-.--- Exit 2
.- Exit 3
--- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD
Predict TD location error = +300
Weight = 340K + (480K-340K) * (VEAS-130) / 36
CG = 0.12 + (0.34-0.12) * (VEAS-130) / 36

Wet Exits = 4500, 5950, 7350, 10000
Const Rev Thrust/Roll-const 6.5 Decel
Stow Rev Thrust and coast below 70kt gd
If coasting, do not decel on exit until A/C clears runway

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/roll-constant 6.5 decel/predict TD location error = +300
Mean=47.7, STDEV=4.5

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD
Predict TD location error = +300
Weight=82K+(128K-82K)*(VEAS-110)/33
CG=-0.008+(0.334-(-0.008))*(VEAS-110)/33

MD-81 ROTO Occupancy Time

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

Wet, Exits=4500, 5950, 7350, 10000
Const Rev Thrust/Roll-const 6.5 Decel
Stow Rev Thrust and coast below 70kt gd
If coasting, do not decel on exit until A/C clears runway
MD-81 ROTO ROT Probability Distribution
Wet, Constant reverse thrust/roll-constant 6.5 decel/predict TD location error = +300
Mean=44.1, STDEV=4.038

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Constant 2900 ft exit radius
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/constant 2900 ft exit radius
Mean=44.0, STDEV=4.33

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Constant 2900 ft exit radius
Stow Reverse Thrust = 70 kt gd

TD Ground Speed = Airspeed + Average Tailwind

Runway Occupancy Time

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/constant 2900 ft exit radius
Mean=38.6, STDEV=3.364

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3100, 4550, 6150, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=50.9, STDEV=9.05

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3100, 4550, 6150 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

Wet Exits = 3100, 4550, 6150, 10000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=41.1, STDEV=4.122

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3100, 4550, 6150 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \cdot (VEAS - 130) / 36

CG = 0.12 + (0.34 - 0.12) \cdot (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 5100, 6550, 7750, 12000

Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=47.1, STDEV=4.07

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5100, 6550, 7750 & 12000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) \times (\text{VEAS} - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) \times (\text{VEAS} - 110) / 33

Wet, Exits: 5100, 6550, 7750, 12000
Auto reverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel
Mean=44.4, STDEV=3.457

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5100, 6550, 7750 & 12000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Ice, Exits = 4500, 5950, 7350, 10000, 15000, 50000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Ice, Auto reverse thrust/variable decel
Mean=90.6, STDEV=17.7

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time
Snow, Exits = 4500, 5950, 7350, 10000, 15000, 50000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Snow, Auto reverse thrust/variable decel
Mean=48.5, STDEV=5.15

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4
- Exit 5
- Exit 6

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time
Slush, Exits = 4500, 5950, 7350, 10000, 15000, 50000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Slush, Auto reverse thrust/variable decel
Mean=46.7, STDEV=4.06

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time
Flood Exits = 4500, 5950, 7350, 10000, 15000, 50000
Autoreverse Thrust/Variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Flood, Auto reverse thrust/variable decel
Mean=71.1, STDEV=19.8

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Ice, Exits = 4500, 5950, 7350, 10000, 15000, 50000
Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

MD-81 ROTO Occupancy Time

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Ice, Auto reverse thrust/variable decel
Mean=54.4, STDEV=13.24

Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Auto reverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

MD-81 ROTO Occupancy Time
Snow, Exits = 4500, 5950, 7350, 10000, 15000, 50000

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

1199
MD-81 ROTO ROT Probability Distribution
Snow, Auto reverse thrust/variable decel
Mean=42.6, STDEV=3.533

Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time
Slush Exits = 4500, 5950, 7350, 10000, 15000, 50000

Autoreverse Thrust/variable Deceleration
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Slush, Auto reverse thrust/variable decel
Mean=41.3, STDEV=3.149

Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = 0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33
MD-81 ROTO ROT Probability Distribution
Flood, Auto reverse thrust/variable decel
Mean=46.7, STDEV=5.939

Curves Represent Exits at 4500, 5950, 7350, 10000, 15000 & 50000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Reverse Thrust Idle on Exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust Idle on Exit
Mean=47.3, STDEV=4.2

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/variable Deceleration
Reverse Thrust Idle on Exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust Idle on Exit
Mean=41.9, STDEV=3.909

All Exits
- - - Exit 1
- - - Exit 2
- - Exit 3
- - - Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

WO, Exits = 5225, 6650, 10000
Autoreverse Thrust/Variable Deceleration
2 high-speed exits
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/2 high-speed exits
Mean=48.4, STDEV=6.38

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5225, 6650 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K)*(VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008))*(VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 5225, 6650, 10000
Autoreverse Thrust/variable Deceleration
2 high-speed exits
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location
Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/2 high-speed exits
Mean=45.1, STDEV=3.555

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5225, 6650 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 5950, 10000
Autoreverse Thrust/Variable Deceleration
1 high-speed exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 5950, 10000
Autoreverse Thrust/variable Deceleration
1 high-speed exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/4th exit location at 8300
Mean=41.1, STDEV=3.893

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950, 8300 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K-340K)*(VEAS-130)/36
CG = 0.12 + (0.34-0.12)*(VEAS-130)/36

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Touchdown lateral offset = 27 ft
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

221
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/td lateral offset=27ft
Mean=47.3, STDEV=4.21

- All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
MD-81 RTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/1 high-speed exit
Mean=50.9, STDEV=5.093

All Exits
- Exit 1
- Exit 2

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 5950 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 8300, 10000
Autoreverse Thrust/variable Deceleration
4th Exit Location at 8300
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
Predict exit prior to TD

Weight = 82K + (128K-82K) * (VEAS-110)/33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS-110)/33

Wet, Exits = 3900, 5350, 6950, 8300, 10000
Autoreverse Thrust/variable Deceleration
4th Exit Location at 8300
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Touchdown lateral offset = 27 ft
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/td lateral offset=27ft
Mean=41.5, STDEV=3.433

All Exits

Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \* (VEAS - 130)/36

CG = 0.12 + (0.34 - 0.12) \* (VEAS - 130)/36

Wet, Exits = 4500, 5950, 7350, 10000

Auto reverse Thrust/Variable Deceleration

Aircraft CG stops on Exit at Y = 480 ft

Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

2450
2250
2050
1850
1650
1450
1250
1050
850
650
450
250
130-25
145-10
140-15
135-20
130-25
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/Aircraft CG stops on Exit at Y=480ft
Mean=47.4, STDEV=4.21

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/variable Deceleration
Aircraft CG stops on Exit at Y = 480ft
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/Aircraft CG stops on Exit at Y=480ft
Mean=41.5, STDEV=3.421

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Auto reverse Thrust/variable Deceleration
Allow maximum 9ft/s/s decel
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust variable decel/allow max 9ft/s/s decel
Mean=45.4, STDEV=4.5

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Autoreverse Thrust/variable Deceleration
Allow maximum 9ft/s/s decel
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/allow max 9ft/s/s decel
Mean=40.5, STDEV=3.701

Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \times (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) \times (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Autoreverse Thrust/variable Deceleration
Anti-skid Efficiency = 90%
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=90%
Mean=47.9, STDEV=5.17

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 3900, 5350, 6950, 10000
Auto reverse Thrust/variable Deceleration
Anti-skid Efficiency = 90%
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=90%
Mean=40.9, STDEV=3.833

All Exits
Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \times (VEAS - 130) / 36

CG = 0.12 + (0.34 - 0.12) \times (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000

Autoreverse Thrust/Variable Deceleration

Anti-skid Efficiency = 60%

Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=60%
Mean=47.4, STDEV=4.51

All Exits
--- Exit 1
--- Exit 2
--- Exit 3
--- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD
Weight=82K+(128K-82K)*(VEAS-110)/33
CG=-0.008+(0.334-(-0.008))*(VEAS-110)/33

Wet, Exits=4500, 5950, 7350, 10000
Auto reverse Thrust/variable Deceleration
Anti-skid Efficiency=60%
Stow Reverse Thrust=70 kt gd
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=60%
Mean=41.7, STDEV=3.419

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Wet Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
60 kt exit speed
Stow Reverse Thrust = 60 kt gd

TD Ground Speed = Airspeed + Average Tailwind

MD-11 ROTO Occupancy Time

Runway Occupancy Time

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=54, STDEV=8.56

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 3500, 4950, 6550, 10000
Autoreverse Thrust/variable Deceleration
60 kt exit speed
Stow Reverse Thrust = 60 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/60 kt exit speed
Mean=44.7, STDEV=4.174

All Exits
Exit 1
Exit 2
Exit 3
Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/Variable Deceleration
Stow Reverse Thrust = 40 kt gd
40 knot high speed exit

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

53-57
57
53
49-53
49
45-49
45
41-45
41
37-41
165 + 167
160 + 5
155
150-5
145-10
140-15
135-20
130-25
250
2450
2250
2050
1850
1650
1450
1250
1050
850
650
450
250

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/40 kt exit speed
Mean=66.1, STDEV=7.48

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust / variable Deceleration
Stow Reverse Thrust = 40 kt gd
40 knot high speed exit

Runway Occupancy Time

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/40 kt exit speed
Mean=57.8, STDEV=4.759

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \cdot (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) \cdot (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Reverse Thrust NOT Stowed

Runway Occupancy Time

160+5
165+18
41
45
49
53
57

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

2450
2250
2050
1850
1650
1450
1250
1050
0850
0650
0450
0250
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust NOT Stowed
Mean=47.3, STDEV=4.21

All Exits

Exit 1
Exit 2
Exit 3
Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K-82K)*(VEAS-110)/33
CG = -0.008 + (0.334 - (-0.008))*(VEAS-110)/33

MD-81 ROTO Occupancy Time

Autoreverse Thrust/variable Deceleration
Reverse Thrust Idle on Exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust NOT Stowed
Mean=41.9, STDEV=3.897

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Reverse Thrust Idle on Runway
Stow Reverse Thrust = 70 kt gd

TD Ground Speed = Airspeed + Average Tailwind

MD-11 ROTO Occupancy Time

Runway Occupancy Time

TD X Location Past Threshold
MD-11 ROTO ROTO Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust Idle on Runway
Mean=48.8, STDEV=5.04

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Reverse Thrust Idle on Runway
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Reverse Thrust Idle on Runway
Mean=41.7, STDEV=3.503
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
NO Reverse Thrust

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/NO Reverse Thrust
Mean=53.3, STDEV=6.61

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/NO Reverse Thrust
Mean=43.7, STDEV=4.287

All Exits
- - - Exit 1
- - - - Exit 2
- - - - - Exit 3
- - - - - - Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Immediate maximum reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

Wet, Exits = 3500, 4950, 6550, 10000
MD-11 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=48, STDEV=8.89

All Exits
- - - - Exit 1
- - - - Exit 2
-- --- Exit 3
- - - - Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
No exit prediction

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 * (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Immediate maximum reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold

Wet, Exits = 3500, 4950, 6550, 10000
MD-81 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=40.8, STDEV=4.654

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3500, 4950, 6550 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K)*(VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12)*(VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Immediate maximum reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind

53-57
49-53
45-49
41-45
37-41

57
53
49
45
41
165+187
160+5
155
150-5
145-10
140-15
135-20
130-25
250
2450
2250
2050
1850
1650
1450
1250
1050
850
650
MD-11 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=46.9, STDEV=6.59

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
No exit prediction

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Immediate maximum reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=40.5, STDEV=4.537

Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Immediate maximum reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

MD-11 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

Threshold X Location Past Threshold

53-57
49-53
45-49
41-45
37-41
MD-11 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=45.9, STDEV=5.04

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Immediate maximum reverse thrust and 6.5 constant decel
Stow Reverse Thrust and coast below 70 kt gd
If coasting, do not decel on exit until A/C clears runway

Dry, Exits = 4500, 5950, 7350, 10000

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Dry, Maximum reverse thrust/constant 6.5 decel
Mean=45.3, STDEV=4.3

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 82K + (128K-82K)*(VEAS-110)/33
CG = -0.008 + (0.334-(-0.008))*(VEAS-110)/33

Immediate maximum reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

MD-81 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Maximum reverse thrust/constant 6.5 decel
Mean=41.9, STDEV=4.066

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
No exit prediction

Weight = 82K + (128K-82K) * (VEAS-110)/33
CG = -0.008 + (0.334 + 0.008) * (VEAS-110)/33

MD-81 ROTO Occupancy Time

Immediate maximum reverse thrust and constant 6.5 decel
Stow Reverse Thrust and coast below 70 kt gnd spd
If coasting, do not decel on exit until A/C clears runway

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

Dry, Exits = 4500, 5950, 7350, 10000

TD X Location Past Threshold

53-57
49-53
45-49
41-45
37-41
MD-81 ROTO ROT Probability Distribution
Dry, Maximum reverse thrust/constant 6.5 decel
Mean=41, STDEV=3.735

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

Wet, Exits = 4500, 5950, 7350, 10000
Auto reverse Thrust/Variable Deceleration
Auto asymmetric braking on Exit
Stow Reverse Thrust = 70 kt gd

TD Ground Speed = Airspeed + Average Tailwind

MD-11 ROTO Occupancy Time

Runway Occupancy Time

53-57
49-53
45-49
41-45
37-41

TD X Location Past Threshold

2450
2250
2050
1850
1650
1450
1250
1050
850
650
450
250
130-25
135-20
140-15
145-10
150-5
160-5
165+187
57
53
49
45
41
155
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Auto asymmetric braking on Exit
Mean=45.7, STDEV=4.25

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Auto asymmetric braking on Exit
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust variable decel/Auto asymmetric braking on Exit
Mean=40.3, STDEV=3.424

All Exits
Exit 1
Exit 2
Exit 3
Exit 4

Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) \cdot (VEAS - 130)/36
CG = 0.12 + (0.34 - 0.12) \cdot (VEAS - 130)/36

MD-11 ROTO Occupancy Time

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/Variable Deceleration
Anti-skid Efficiency = 90%
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=90%
Mean=47.1, STDEV=4.12

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

Wet, Exits = 4500, 5950, 7350, 10000
Autoreverse Thrust/variable Deceleration
Anti-skid Efficiency = 90%
Stow Reverse Thrust = 70 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/Anti-skid Efficiency=90%
Mean=41.5, STDEV=3.21

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

Probability

284

0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 4500, 5950, 7350 & 10000 feet
Predict exit prior to TD

Weight = 340K + (480K - 340K) * (VEAS - 130) / 36
CG = 0.12 + (0.34 - 0.12) * (VEAS - 130) / 36

MD-11 ROTO Occupancy Time

Wet, Exits = 3900, 5350, 6950, 10000
Autoreverse Thrust/variable Deceleration
40 kt exit entrance ground speed
Stow Reverse Thrust = 40 kt gd

Runway Occupancy Time

TD X Location Past Threshold

TD Ground Speed = Airspeed + Average Tailwind
MD-11 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/40 kt exit speed
Mean=68.6, STDEV=9.4

All Exits
--- Exit 1
--- Exit 2
--- Exit 3
--- Exit 4

MD-11 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
Predict exit prior to TD

Weight = 82K + (128K - 82K) * (VEAS - 110) / 33
CG = -0.008 + (0.334 - (-0.008)) * (VEAS - 110) / 33

MD-81 ROTO Occupancy Time

Wet Exits = 3900, 5350, 6950, 10000
Autoreverse Thrust/variable Deceleration
40 kt exit entrance ground speed
Stow Reverse Thrust = 40 kt gd

Runway Occupancy Time

TD Ground Speed = Airspeed + Average Tailwind

TD X Location Past Threshold
MD-81 ROTO ROT Probability Distribution
Wet, Auto reverse thrust/variable decel/40 kt exit speed
Mean=58.2, STDEV=4.785

All Exits
- Exit 1
- Exit 2
- Exit 3
- Exit 4

MD-81 Runway Occupancy Time (ROT) seconds
Curves Represent Exits at 3900, 5350, 6950 & 10000 feet
The Terminal Area Productivity (TAP) research program was initiated by NASA to increase the airport capacity for transport aircraft operations. One element of the research program is called Low Visibility Landing and Surface Operations (LVLASO). A goal of the LVLASO research is to develop transport aircraft technologies which reduce Runway Occupancy Time (ROT) so that it does not become the limiting factor in the terminal area operations that determine the capacity of a runway. Under LVLASO, the objective of this study was to determine the sensitivity of ROT to various factors associated with the Rollout and Turnoff (ROTO) operation for transport aircraft. The following operational factors were studied and are listed in the order of decreasing ROT sensitivity:

1. Ice/flood runway surface condition
2. Exit entrance ground speed
3. Number of exits
4. High-speed exit locations and spacing
5. Aircraft type
6. Touchdown ground speed standard deviation
7. Reverse thrust and braking method
8. Accurate exit prediction capability
9. Maximum reverse thrust availability
10. Spiral-arc vs. circle-arc exit geometry
11. Dry/slush/wet/snow runway surface condition
12. Maximum allowed deceleration
13. Auto asymmetric braking on exit
14. Do not stow reverse thrust before the exit
15. Touchdown longitudinal location standard deviation
16. Flap setting
17. Anti-skid efficiency
18. Crosswind conditions
19. Stopping on the exit
20. Touchdown lateral offset